CLAIMS:

1. A computer tomography method having the following steps:

a) generation, by a radiation source (S), of a conical beam of rays (4) that passes through an examination region (14) and an object situated therein,

b) production of a relative movement between the radiation source (S) on the one hand and the examination region (13) on the other hand, which movement comprises at least a rotary movement about an axis of rotation (14) and is in particular in the form of a helix (17) or circle,

c) cquisition, by a detector unit (16) and during the relative movement, of measured values that depend on the intensity in the beam of rays (4) on the farther side of the examination region (13),

d) etermination, with the help of redundant measured values, of a complementary measured value for each of at least some of the measured values that were acquired in step c) and that lie within a reconstruction window (25), the rays associated with the given measured value and the complementary measured value belonging to it being oriented in opposite directions to one another,

e) eplacement of each measured value for which a complementary measured value was determined in step d) by a sum comprising the measured value, having been weighted, and the complementary measured value, having been weighted,

f) econstruction of a CT image of the examination region (13) from the measured values lying within the reconstruction window (25).

2. A computer tomography method as claimed in claim 1, characterized in that, if a ray that is associated with a complementary measured value from step d) follows the same path as a ray that is associated with a measured value that was acquired in step c), the complementary measured value is set to be equal to this measured value, and in that, if a ray that is associated with a complementary measured value from step d) does not follow the same path as one of the rays that are associated with the measured values that were acquired in step c), the complementary measured value in question is determined with the help of John's equation.

3. A computer tomography method as claimed in claim 1, characterized in that, prior to the addition in step e), the complementary measured value and the associated measured value are each multiplied by a weighting factor, the weighting factors for a complementary measured value and the measured value belonging thereto being equal if the ray that is associated with the complementary measured value from step d) follows the same path as one of the rays that are associated with the measured values that were acquired in step c), and the weighting factor for a measured value being greater than the weighting factor for an associated complementary measured value if the ray that is associated with the complementary measured value from step d) does not follow the same path as one of the rays that are associated with the measured values that were acquired in step c).

4. A computer tomography method as claimed in claim 1, characterized in that, in step c) the relative movement is in the form of a helix (17) and in that the reconstruction of a CT image in step f) comprises the following steps:

- partial derivation of measured values with which parallel rays (51) having different radiation source positions (λ_a, λ_b, λ_c) are associated, for an angular position of the radiation source (S) on the helix (17) that is associated with the given measured value,
- filtering of the derived measured values along κ lines (57),
- reconstruction of the CT image by back-projection of those filtered measured values that lie within a PI window (25).

5. A computer tomography method as claimed in claim 4, characterized in that the filtering of a measured value comprises the following steps:

- determination of a κ line (57) for the measured value,
- multiplication of those measured value that are situated on the κ line (57) by a weighting factor that increases with the reciprocal of the sine of the κ angle and in particular is equal to this reciprocal,
- adding up of the weighted measured values lying on the κ line (57), the resulting sum being the filtered measured value.

6. A computer tomograph having

- a radiation source (S) for generating a conical beam of rays (4) that passes through an examination region (13) and an object situated therein,

- a drive arrangement (2, 5) to enable an object contained in the examination region (13) and the radiation source (S) to be caused to rotate relative to one another about an axis of rotation (14) and to be displaced parallel to the axis of rotation (14),
- a detector unit (16), coupled to the radiation source (S), that has a detector surface, for acquired measured values,
- a reconstructing unit (10) for reconstructing a CT image within the examination region from the measured values acquired by the detector unit (16),
- a control unit (7) for controlling the radiation source (S), the detector unit (16), the drive arrangement (2, 5) and the reconstructing unit (10) in the following steps:

a) generation, by the radiation source (S), of a conical beam of rays (4) that passes through the examination region (13) and the object situated therein,

b) production of a relative movement between the radiation source (S) on the one hand and the examination region (13) on the other hand, which movement comprises at least a rotary movement about the axis of rotation (14) and is in particular in the form of a helix (17) or circle,

c) acquisition, by the detector unit (16) and during the relative movement, of measured values that depend on the intensity in the beam of rays (4) on the farther side of the examination region (13),

d) determination, with the help of redundant measured values, of a complementary measured value for each of at least some of the measured values that were acquired in step c) and that lie within a reconstruction window (25), the rays associated with the given measured value and the complementary measured value belonging to it being oriented in opposite directions to one another,

e) replacement of each measured value for which a complementary measured value was determined in step d) by a sum comprising the measured value, having been weighted, and the complementary measured value, having been weighted,

f) reconstruction of a CT image of the examination region (13) from the measured values lying within the reconstruction window (25).

7. A computer program for a control unit (7) for controlling a radiation source (S), a detector unit (16), a drive arrangement (2, 5) and a reconstructing unit (10) of a computer tomograph to perform the method claimed in claim 1 in the following sequence:

a) generation, by the radiation source (S), of a conical beam of rays (4) that passes through the examination region (13) and the object situated therein,

b) production of a relative movement between the radiation source (S) on the one hand and the examination region (13) on the other hand, which movement comprises at least a rotary movement about the axis of rotation (14) and is in particular in the form of a helix (17) or circle,

c) acquisition, by the detector unit (16) and during the relative movement, of measured values that depend on the intensity in the beam of rays (4) on the farther side of the examination region (13),

d) determination, with the help of redundant measured values, of a complementary measured value for each of at least some of the measured values that were acquired in step c) and that lie within a reconstruction window (25), the rays associated with the given measured value and the complementary measured value belonging to it being oriented in opposite directions to one another,

e) replacement of each measured value for which a complementary measured value was determined in step d) by a sum comprising the measured value, having been weighted, and the complementary measured value, having been weighted,

f) reconstruction of a CT image of the examination region (13) from the measured values lying within the reconstruction window (25).